NOTICE

All drawings located at the end of the document.

Environmental Restoration
RFCA Standard Operating Protocol
For Routine Soil Remediation
FY04 Notification #04-03
IHSS Groups 500-1 and 500-5

November 2003

1/15

Environmental Restoration
RFCA Standard Operating Protocol
For Routine Soil Remediation
FY04 Notification #04-03
IHSS Groups 500-1 and 500-5

Approval received from the Colorado Department of Public Health and Environment

( ).

Approval letter is contained in the Administrative Record.

November 2003

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ACRONYMS

AL	action level
BMP	best management practice
COC	contaminant of concern
cy	cubic yard
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
dl	detection limit
EDDIE	Environmental Data Dynamic Information Exchange
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
FY	Fiscal Year
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
nCi/g	nanocuries per gram
NPWL	New Process Waste Lines
NFA	No Further Action
PA	Protected Area
PAC	Potential Area of Concern
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
PDF	Portable Document Format
PCOC	potential contaminant of concern
POC	Point of Compliance
POE	Point of Evaluation
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RSOP	RFCA Standard Operating Protocol
SSRS	Subsurface Soil Risk Screen
SWD	Soil-Water Database
UBC	Under Building Contamination
VOC	volatile organic compound
WRW	wildlife refuge worker

1.0 INTRODUCTION

This Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003a) Fiscal Year (FY) 04 Notification includes the notification to remediate Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern (PACs), and Under Building Contamination (UBC) Sites at the Rocky Flats Environmental Technology Site (RFETS) Industrial Area (IA) during FY04. The purpose of this Notification is to invoke the ER RSOP for IHSS Groups 500-1 and 500-5. Activities specified in the ER RSOP are not reiterated here; however, deviations from the ER RSOP are included where appropriate.

Soil with contaminant concentrations greater than the RFCA action levels (ALs), or as indicated by the Subsurface Soil Risk Screen (SSRS), and associated debris will be removed in accordance with RFCA (DOE et al 2003) and the ER RSOP (DOE 2003a).

IHSS Groups 500-1 and 500-5 are shown on Figure 1, and the proposed remediation sites covered under ER RSOP Notification #04-03 are listed in Table 1.

Table 1
Potential Remediation Areas for IHSS Groups 500-1 and 500-5

IHSS Group	IHSS/PAC/UBC Site	PCOCs	Media	Estimated Remediation Volume
500-1	IHSS 300-186, Valve Vaults 11, 12 and 13	Radionuclides, Metals, VOCs, Nitrate/Nitrite	Surface and Subsurface Soil	<2 cy
	IHSS 500-117.1, North Chemical Storage Site	Radionuclides, Metals, VOCs, PCBs	Surface and Subsurface Soil	<2 cy
	IHSS 500-197, Scrap Metal Storage Site	Radionuclides, Metals, VOCs, PCBs	Surface and Subsurface Soil	<2 cy
500-5	PAC 500-904, Transformer Leak – 223-1/223-2	PCBs	Surface and Subsurface Soil	<2 cy

VOC – volatile organic compound
PCB- polychlorinated biphenyl
cy – cubic yard

2.0 IHSS GROUPS 500-1 AND 500-5

IHSS Group 500-1 includes IHSS 300-186, Valve Vaults 11, 12, and 13; IHSS 500-117.1, North Chemical Storage Site; and IHSS 500-197, Scrap Metal Storage Site. IHSS Group 500-5 includes PAC 500-904, Transformer Leak – 223-1/223-2. IHSS Groups 500-1 and 500-5 are shown on Figure 2.

2.1 Potential Contaminants of Concern

Potential contaminants of concern (PCOCs) at IHSS Groups 500-1 and 500-5 are listed in Table 1. The PCOCs were determined based on process knowledge and data collected during previous studies (DOE 1992; DOE 2001; DOE 2000a).

2.2 Project Conditions

The following conditions are present within IHSS Groups 500-1 and 500-5:

- IHSS 300-186 consists of an L-shaped area including soil surrounding Valve Vaults 11, 12, and 13 and associated underground New Process Waste Lines (NPWL) (Figure 2). The IHSS does not include the valve vaults and the NPWL (refer to Section 2.4). In addition, the IHSS includes the northeastern corner of IHSS 300-156.1, the Building 371 Parking Lot (Figure 2). IHSS 300-156.1 was approved as a No Further Action (NFA) site (EPA et al 2002).

- IHSS 500-197, Scrap Metal Storage Site, consists primarily of a former PA perimeter fence area. IHSS 500-197 also includes a section of the Protected Area (PA) patrol road west of Building 559 (Figure 2). In 1981, excavation during construction of the PA security fence uncovered scrap metal debris in trenches located west of Building 559. The trenches were re-excavated, the buried materials were removed, and the trenches were backfilled to complete construction of the PA fence (DOE 1992). IHSS 500-197 bounds the re-excavated burial sites.

- IHSS 500-117.1, North Chemical Storage Site, includes a site employee parking area and Buildings 223 and 549. The northeastern portion of IHSS 500-117.1 overlaps IHSS 500-197 and includes a section of the former PA perimeter fence area. The southern section of IHSS 500-117.1 overlaps the eastern portion of IHSS 300-186, which includes soil surrounding Valve Vault 11 and the NPWL (Figure 2). This IHSS, however, does not include the buried debris in IHSS 500-197 and the soil surrounding the valve vault and NPWL.

- PAC 500-904, Transformer Leak – 223-1/223-2, consists of two electrical transformers on concrete pads. These transformers are known to have leaked.

2.3 RFCA SSRS Evaluation

An SSRS is performed when non-radionuclides and uranium are present in the soil below 6 inches from the ground surface, when americium and plutonium are present below 3 feet from the ground surface, and for soil beneath below-grade structures. Current site conditions are evaluated to determine whether remediation is required by the SSRS. Some aspects of the SSRS cannot be evaluated now, but will be evaluated after characterization.

Screen 1 – Are contaminant of concern (COC) concentrations below RFCA Table 3 soil ALs for the wildlife refuge worker (WRW)?

Existing soil data, discussed in the IA Sampling and Analysis Plan (IASAP) Addendum for IHSS Groups 500-1 and 500-5 (DOE 2003b), do not indicate that contaminant concentrations exceed RFCA WRW ALs. However, historical knowledge indicates that additional characterization is warranted. The IHSS Groups will be further characterized in accordance with IASAP Addendum #IA-04-03, and results will be documented in a data summary or closeout report.

Screen 2 – Is there a potential for subsurface soil to become surface soil (landslide and erosion areas identified on Figure 1)?

IHSS Groups 500-1 and 500-5 are not located in an area subject to erosion and landslides in accordance with Figure 1 of RFCA Attachment 5 (DOE et al 2003), however, the area may have some erosion potential.

Screen 3 – Does subsurface soil contamination for radionuclides exceed criteria defined in Section 5.3 and Attachment 14?

Existing soil data, discussed in the IASAP Addendum for IHSS Groups 500-1 and 500-5 (DOE 2003b), do not indicate that concentrations of radionuclides exceed RFCA WRW ALs. However, historical knowledge indicates that additional characterization is warranted (refer to Screen 1). Therefore, the IHSS Groups will be further characterized in accordance with IASAP Addendum #IA-04-03, and results will be documented in a data summary or closeout report.

Screen 4 – Is there an environmental pathway and sufficient quantity of COCs that would cause an exceedance of the surface water standards?

Contaminant migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated from IHSS Groups 500-1 and 500-5. The nearest downgradient RFCA surface water Point of Evaluation (POE) is SW093 (DOE 2003c). SW093 receives water from a large part of the IA, and surface water quality at SW093 may not be attributable to any single upgradient IHSS Group. In addition, based on existing data (DOE 2003b), there does not appear to be sufficient contaminant concentrations in the IHSS Groups to cause downgradient exceedances of surface water standards. However, the findings and conclusions of previous Walnut Creek and SW093 source evaluations suggest that one or more low-level distributed actinide source areas exist within the SW093 subdrainage. Therefore, additional characterization is warranted (refer to Screen 1), and the potential for the IHSS Groups to cause exceedances of surface water standards will be re-evaluated after the additional characterization is completed.

Screen 5 – Are COC concentrations below RFCA Table 3 soil ALs for ecological receptors?

Existing soil data, discussed in the IASAP Addendum for IHSS Groups 500-1 and 500-5 (DOE 2003b), do not indicate that contaminant concentrations exceed RFCA WRW ALs. However, historical knowledge indicates that additional characterization is warranted (refer to Screen 1). Therefore, the IHSS Groups will be further characterized in accordance with IASAP Addendum #IA-04-03, and results will be compared to the ecological receptor ALs and documented in a data summary or closeout report.

2.4 Remediation Plan

This RSOP Notification remediation plan for IHSS Groups 500-1 and 500-5 includes the following objectives:

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- Remove the two PAC 500-904 transformer pads. The concrete pads will be recycled in accordance with the RSOP for Recycling Concrete (DOE 1999) or disposed at an appropriate facility based on waste characterization results.
- Remove soil with non-radionuclide or uranium contaminant concentrations greater than the RFCA WRW ALs to a depth of 6 inches. If soil contamination greater than the ALs extends below 6 inches in depth, perform the SSRS to evaluate the need for further accelerated action.
- Remove soil with plutonium-239/240 or americium-241 concentrations greater than the RFCA WRW AL to a depth of 3 feet, or to less than 50 picocuries per gram (pCi/g), whichever comes first. If concentrations are greater than 3 nanocuries per gram (nCi/g) between 3 and 6 feet, characterize and remediate pursuant to RFCA Attachment 5 (DOE et al 2003). If plutonium-239/240 or americium-241 is present at activities greater than the RFCA WRW AL but less than 3 nCi/g below 3 feet, conduct an SSRS.
- Consult with regulatory agencies if contaminant concentrations are greater than the ecological ALs but lower than the WRW ALs.
- If contaminated soil is removed, collect confirmation soil samples in accordance with the IASAP (DOE 2001).

Valve Vaults 11, 12, and 13 and the associated process waste lines connecting these valve vaults will be closed under the Decontamination and Decommissioning (D&D) Program in accordance with the Closure Description Document of the Partial Closure of Unit 374.3 – 700 and 800 Area Process Waste Transfer System (DOE 2003d). Removal of the Building 223 and 549 slabs located in IHSS 500-117.1 will be conducted under the D&D Program in accordance with the RSOP for Facility Disposition (DOE 2000b).

It is anticipated that after remediation there may be areas with concentrations of metals, radionuclides, and organics greater than background means plus two standard deviations or detection limits (DLs), but below RFCA ALs.

2.5 Stewardship Evaluation

This notification covers IHSS 300- 186, IHSS 500-117.1, IHSS 500-197, and PAC 500-904. No UBC sites are included in this notification. Based on the PCOCs (Table 1 and Section 2.1) and the ER RSOP (DOE 2003a), it is anticipated that all contamination above RFCA ALs will be remediated. Figure 2 shows the potential remediation areas.

If remediation is conducted, an additional stewardship evaluation will be performed during remediation using the consultative process and documented in a closeout report for IHSS Groups 500-1 and 500-5. A new map of residual contamination will be generated after remediation. The following sections present the stewardship evaluation.

2.5.1 Proximity to Other Contaminant Sources

IHSS Groups 500-1 and 500-5 are in the RFETS IA and are located close to other contaminant sources. IHSS Group 300-3, which includes UBC 371, and IHSS Group

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300-4, which includes UBC 374, are located northwest of IHSS Group 500-1. IHSS Group 500-3, which includes UBC 559 and UBC 528, is located east of IHSS Group 500-1. IHSS Group 500-2, which includes IHSS 500-158, and IHSS Group 500-4, which includes IHSS 500-117.2, are located south of IHSS Group 500-1.

2.5.2 Surface Water Protection

Surface water protection includes the following considerations:

Is there a pathway to surface water from potential erosion to streams or drainages?

Soil contaminants from IHSS Groups 500-1 and 500-5 could migrate to surface water via erosion. The general drainage is to the north, and surface runoff is conveyed to North Walnut Creek.

Do characterization data indicate there are contaminants in surface soil?

Existing soil data, discussed in the IASAP Addendum for IHSS Groups 500-1 and 500-5 (DOE 2003b), do not indicate that contaminant concentrations exceed RFCA WRW ALs. However, historical knowledge indicates that additional characterization is warranted (refer to Section 2.3, Screen 1). Therefore, the IHSS Groups will be further characterized in accordance with IASAP Addendum #IA-04-03, and results will be documented in a data summary or closeout report.

Do monitoring results from POEs or Points of Compliance (POCs) indicate there are surface water impacts from the area under consideration?

Recent water quality monitoring results from SW093, which receives runoff from IHSS Groups 500-1 and 500-5 and is the nearest POE, indicate no adverse surface water impacts from the IHSS Groups. Surface water data for the IHSS Groups' PCOCs indicate no exceedance of surface water standards (DOE 2003c). However, the findings and conclusions of previous Walnut Creek and SW093 source evaluations suggest that one or more low-level distributed actinide source areas exist within the SW093 subdrainage.

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

IHSS Groups 500-1 and 500-5 are not located in an area subject to erosion in accordance with Figure 1 of the RFCA Attachment 5 (DOE et al 2003), however, the area may have some erosion potential.

2.5.3 Monitoring

Monitoring includes the following considerations:

Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

Two groundwater monitoring wells are located within IHSS Group 500-1: P114589 and P114789. These are not POE or POC wells. Data in the RFETS Soil-Water Database (SWD) indicate that all contaminant concentrations in both wells were below the RFCA

Tier I groundwater ALs. Contaminant concentrations in Well P114589 were also below Tier II ALs. Well P114789 had tetrachloroethene concentrations greater than the Tier II AL in samples collected in November 1993, August 1994, November 1994, January 1995, and June 2003.

The groundwater contamination at IHSS Group 500-1 is considered part of the IA Plume. The Site plume location map (DOE 2003e) indicates that the VOC plume underlies the IHSS Group. This plume is much larger than the IHSS Group and probably is attributable to multiple sources within the IA, including perhaps IHSS Group 500-1. Groundwater in the area of this IHSS Group is downgradient of a significant portion of the IA, and contaminant levels could be attributable to upgradient sources. Further groundwater evaluation will be conducted as part of the groundwater plume remedial decision and future sitewide evaluation.

Can the impact be traced to a specific IHSS Group?

Impacts cannot be traced to IHSS Groups 500-1 and 500-5; however, IHSS Group 500-1 could be a source of contamination.

Are additional monitoring stations needed?

Not applicable at this time. The need for and placement of monitoring stations will be re-evaluated in the Long-Term Stewardship Plan.

Can existing monitoring locations be deleted if additional remediation is conducted?

Not applicable. Existing wells monitor contamination from areas within and outside IHSS Groups 500-1 and 500-5.

2.5.4 Stewardship Actions and Recommendations

The current stewardship actions and recommendations for IHSS Groups 500-1 and 500-5 are as follows:

- Use best management practices (BMPs) to reduce erosion into surface water drainage.
- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following:
  - Fencing and signs to restrict access; and
  - Soil excavations controlled through the Site Soil Disturbance Permit process.
- Implement long-term stewardship actions, including the following:
  - Prohibitions on construction of buildings in the IA;
  - Restrictions on excavations or other soil disturbance; and
  - Prohibitions on groundwater pumping in the area of IHSS Groups 500-1 and 500-5.

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These recommendations may change based on in-process remediation activities and other future RFETS remediation decisions.

2.6 Accelerated Action Remediation Goals

ER RSOP remedial action objectives (RAOs) include the following:

1. Provide a remedy consistent with the RFETS goal of protection of human health and the environment;

2. Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and

3. Minimize the spread of contaminants during implementation of accelerated actions.

2.7 Treatment

Not applicable.

2.8 Project-Specific Monitoring

High-volume air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations. Approximate locations of air samplers are shown on Figure 2.

2.9 RCRA Units and Intended Waste Disposition

Valve Vaults 11, 12, and 13 and the associated process waste lines connecting these valve vaults will be closed in accordance with the Closure Description Document of the Partial Closure of Unit 374.3 – 700 and 800 Area Process Waste Transfer System (DOE 2003d).

Resource Conservation and Recovery Act (RCRA) Unit 1 is currently planned to be closed during the first or second quarter of FY05. Closure activities will be conducted in compliance with RCRA and RFCA.

2.10 Administrative Record Documents

DOE, 1992, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 2000, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-04-03, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Automated Surface Water Monitoring Report – Second Quarter FY03, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2003, Closure Description Document of the Partial Closure of Unit 374.3 – 700 and 800 Area Process Waste Transfer System, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003, Passive Reactive Barriers and Plume Locations at Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, CDPHE, 2002, Correspondence to J. Legare, DOE RFO, from T. Rehder, EPA Region VIII, S. Gunderson, CDPHE, RE: Approval of NFA Designation for IHSSs & PACs, February 14, 2002.

2.11 Projected Schedule

Remediation of IHSS Groups 500-1 and 500-5 is expected to begin in second quarter of FY04.

3.0 PUBLIC PARTICIPATION

ER RSOP Notification #04-03 activities were discussed at the October 2003 ER/D&D Status meeting. A Portable Document Format (PDF) version of this Notification was provided to the local governments. This Notification is available at the Rocky Flats Reading Rooms and on the Environmental Data Dynamic Information Exchange (EDDIE) Website at www.rfets.gov.

4.0 REFERENCES

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 1999, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000a, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000b, RFCA Standard Operating Protocol for Facility Disposition, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003b, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-04-03, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003c, Automated Surface Water Monitoring Report – Second Quarter FY03, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2003d, Closure Description Document of the Partial Closure of Unit 374.3 – 700 and 800 Area Process Waste Transfer System, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2003e, Passive Reactive Barriers and Plume Locations at Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, CDPHE, 2002, Correspondence to J. Legare, DOE RFO, from T. Rehder, EPA Region VIII, S. Gunderson, CDPHE, RE: Approval of NFA Designation for IHSSs & PACs, February 14, 2002.

Figure 1
IHSS Groups 500-1 and 500-5 Location Map

KEY

- 500-1
- 500-5
- Demolished Building
- Standing Building
- Paved Road

N
W E
S

200 0 200 400 600 800 Feet

Scale = 1:8,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

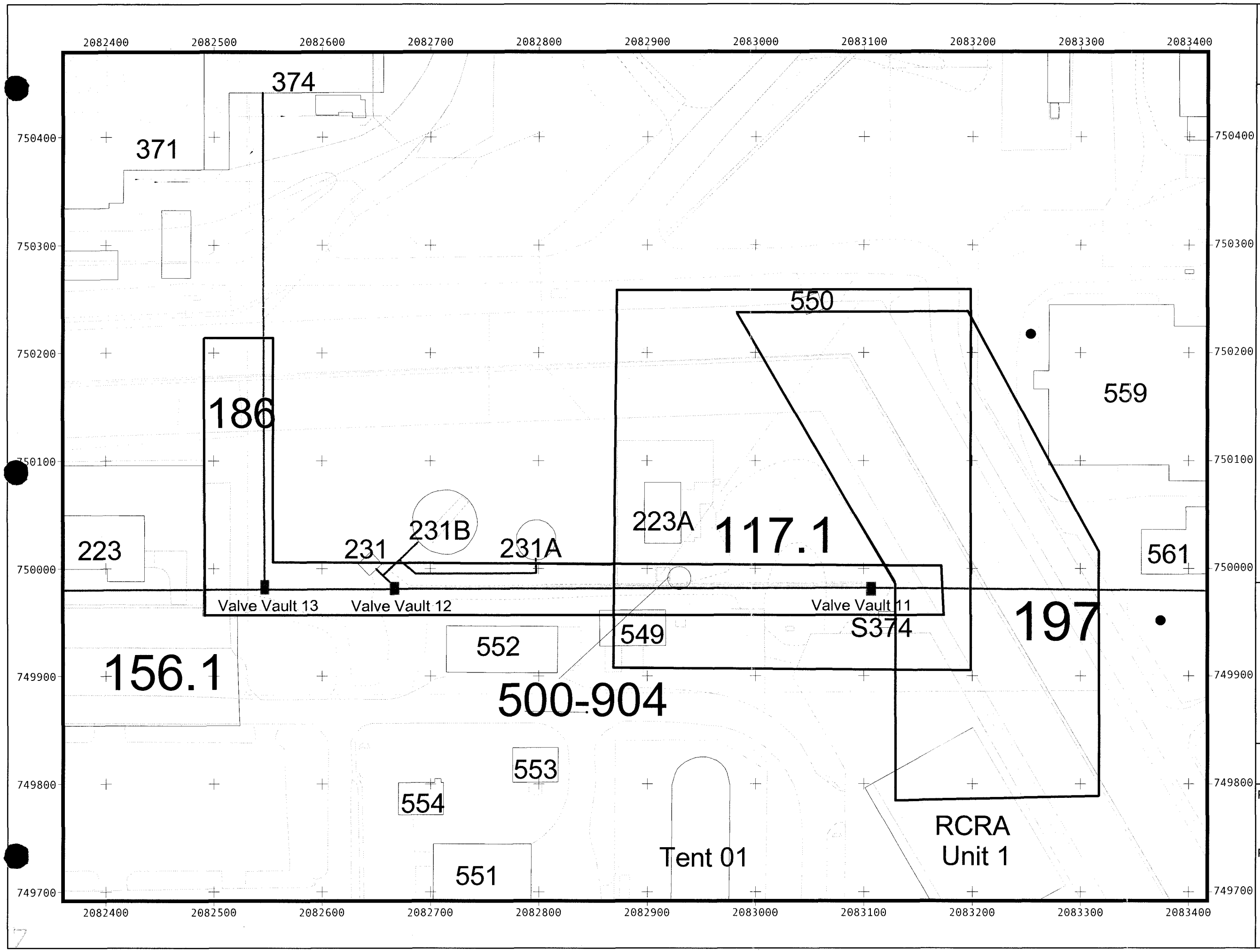
Prepared by: RADMS
Remedial Action Decision Management System

Prepared for: KAISER•HILL COMPANY

File: w:\projects\2003\500-1\500-1 characterization.apr

Date: 10/06/03

Figure 2
Potential Remediation Areas
IHSS Groups 500-1 and 500-5



KEY

- NPWL
- Storm Drain
- Sewer Line
- Foundation Drain
- Paved Road
- Dirt Road
- Streams
- Fence
- Building
- IHSS
- PAC
- Valve Vault
- Approximate Location of Air Sampler

N
W E
S

50 0 50 100 Feet

Scale = 1:1,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: RADMS

Prepared for: KAISER•HILL COMPANY

File: w:\projects\2003\500-1\characterization.apr

Date: 08/27/03